NATO Code of Best Practice (COBP) for C2 Assessment

Data

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Presentation Overview

- **Definitions**
- **Reuse of Data**
- **Data Taxonomy**
  - Data Sources
  - Data Classes
  - Data Domains
- **Data and Problem Formulation**
- **Conclusions and Recommendations**

Data Definitions

- **Data is**
  - factual information
  - organized for analysis
  - suitable for machine processing

  Raw Data

- **Meta Data is**
  - information about information
  - explaining data describing the context of validity, creditability, etc.

Reuse of Data

- Increasing interest in data reuse
- Amount of data is growing with every study
- Real opportunities for reuse are limited, e.g.
  - How to find legacy data
  - Available data seldom in easily accessible form
  - Legacy data is not well documented
  - Security considerations
- Data Engineering to gather, organize and transform legacy data

Data Taxonomy - Data Sources

- **Official Sources**
- **Open Sources**
- **Legacy studies**
- **Subject matter experts**

Common data infrastructure:

- Summary of technical, procedural, and management solution to enable sharing information

Data Taxonomy - Data Classes

- Raw data
- Processed data
- Aggregated data
- Statistical values
- Derived data
- Intermediate data

All processing, aggregating and transforming must be documented => Meta Data
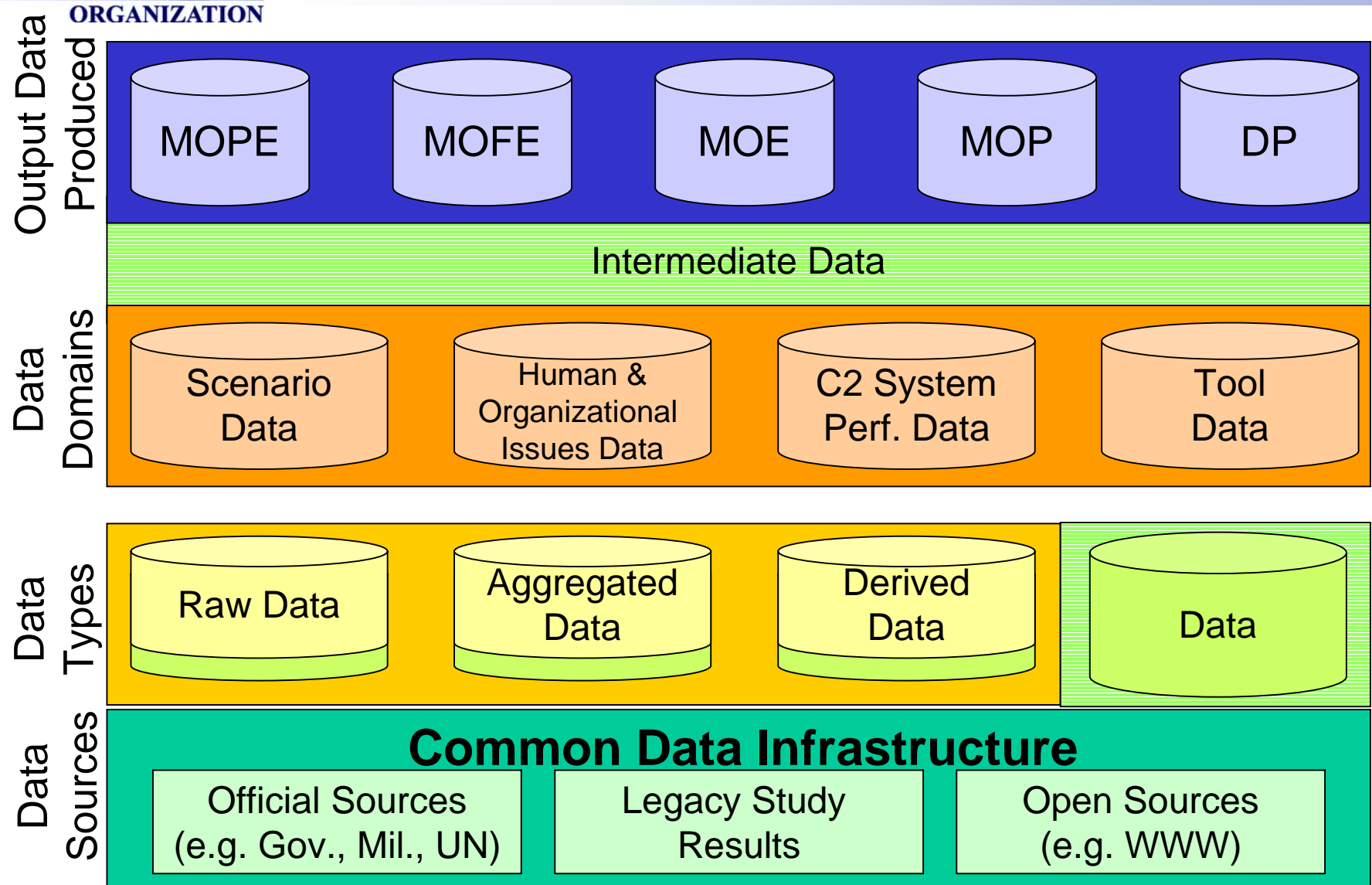
Direct connection to the Chapters of the COBP

- Scenario data

- Human and organizational issues data

- System performance data

- Tool data

- etc.

Data Taxonomy - Summary

SAS-039
R&T ORGANIZATION

Output Data Produced

| MOPE | MOFE | MOE | MOP | DP |

Intermediate Data

Data Domains

| Scenario Data | Human & Organizational Issues Data | C2 System Perf. Data | Tool Data |

Data Types

| Raw Data | Aggregated Data | Derived Data | Data |

Data Sources

Common Data Infrastructure

| Official Sources (e.g. Gov., Mil., UN) | Legacy Study Results | Open Sources (e.g. WWW) |

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- **Data available will be**
  - vague
  - uncertain
  - incomplete
  - contradictory

  Explicit assumptions necessary => Meta Data

- **General challenge**
  - Hard data is needed
  - Soft data is available

Data and Problem Formulation II

The team needs to know

- – What data is needed / structure of data
- – Who owns the data
- – Security issues
- – Costs to buy / collect / generate data

If data is not available and cannot be obtained, it is good practice to use the knowledge of subject matter experts to generate it.

Data and Problem Formulation III

- Archiving of data in retrievable form
- Technical solutions
  - use of available standards
  - agree upon definitions of data
  - study glossary, based on a general and evolving OA/OR glossary (e.g., NATO Joint Pub 1-02).
  - Information Resource Dictionary Systems (IRDS) bring data and meta data together

Conclusions and Recommendations

- Urgent need to agree an standards for data, meta data, and data management

  Data being used today by analysts will be the data needed tomorrow by systems engineers, decision makers and commanders

- Early alignment of standardization with the command and control systems community

Data

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